a [cache] static memory connected to the [main] dynamic memory;

a compression and decompression engine connected between the [main] dynamic memory and the [cache] static memory; and

an error detection and correction engine connected to the [main] dynamic memory and the compression and decompression engine, wherein the dynamic memory, the static memory, the compression and decompression engine, and the error detection and correction engine are located in a single chip.

5. (Amended) The memory device of claim 4 wherein the error detection and correction engine is connected between the [main] dynamic memory and the compression and decompression engine.

6. (Amended) A memory device comprising [on a single semiconductor chip]:

an input/output buffer;

a cache memory connected to the input/output buffer;

a compression and decompression engine connected to the cache memory; and

a main memory connected to the compression and decompression engine, wherein the input/output buffer, the cache memory, the compression and decompression engine, and the main memory and are located in a single chip.

8. (Amended) The memory device of claim 7 further comprising ,on the single chip, an [a] error detection and correction engine connected to the main memory and the compression and decompression engine.

9. (Amended) A system comprising:

a processor; and

a memory device connected to the processor, [wherein] the memory device comprising a main memory and a compression and decompression engine connected to the main memory, wherein the main memory and the compression and decompression engine are located in a single

chip.

10. (Amended) The system of claim 9 wherein the memory device further comprises ,on the single chip, an error detection correction engine connected to the compression and decompression engine.

11. (Amended) A system comprising:

a processor;

[a cache memory;] and

a memory device connected to the processor, wherein the memory device comprises a main memory, a compression and decompression engine connected to the main memory , and a cache memory connected to the compression and decompression engine, wherein the main memory, the compression and decompression engine, and the cache memory and are located in a single chip.

12. (Amended) The system of claim 11 wherein the memory device further comprises ,on the single chip, an error detection correction engine connected to the compression and decompression engine.

15. (Amended) A method of increasing a storage density of a memory device, the method comprising:

[forming] providing a main memory [in a semiconductor chip];

[forming] providing a compression and decompression engine [in the same chip]; and

connecting the compression and decompression engine to the main memory, wherein the main memory and the compression and decompression engine are located in a single chip.

16. (Amended) The method of claim 15 further comprising:

[forming] providing a cache memory in the [same] single chip; and

connecting the cache memory to the compression and decompression engine.

17. (Amended) The method of claim 15 further comprising:

providing an error detection and correction engine in the single chip; and

connecting the error detection and correction engine to the compression and decompression engine.

18. (Amended) A method of operating a memory device, comprising:

receiving input data at a cache memory;

compressing the input data at a compression and decompression engine to produce compressed data; and

storing the compressed data into a main memory [;], wherein the cache memory, the compression and decompression engine, and the main memory are located in a single chip.

19. (Amended) The method of claim 18 further comprising:

reading the compressed data from the main memory;

decompressing the compressed data at the compression and decompression engine to produced decompressed data; and

reading the decompressed data to the cache memory.

20. (Amended) A method of operating a memory device, comprising:

[forming an input/output buffer;]

receiving data at [the] an input/output buffer;

processing the data at a cache memory to produce processed data;

compressing the processed data at a compression and decompression engine to produce compressed data; and

storing the compressed data into a main memory , wherein the input/output buffer, the cache memory, the compression and decompression engine, and the main memory are located in a single chip.

21. (Amended) The method of claim 20 further comprising:

reading the compressed data from the main memory;

decompressing the compressed data at the compression and decompression engine to produced decompressed data;

reading the decompressed data at the cache memory; and

transferring the data to the input/output buffer.

22. (New) A memory device comprising:

an input/output buffer;

a static memory connected to the input/output buffer;

a compression and decompression engine connected to the static memory; and

a dynamic memory connected to the compression and decompression engine, wherein the input/output buffer, the static memory, the compression and decompression engine, and the dynamic memory and are located in a single chip.

23. (New) The memory device of claim 22 further comprising, on the single chip, an error detection and correction engine connected to the dynamic memory and the compression and decompression engine.

24. (New) A system comprising:

a processor; and

a dynamic random access memory device connected to the processor, the dynamic random access memory device including a plurality of memory blocks and a compression and decompression engine connected to the memory blocks, wherein the memory blocks and the compression and decompression engine are located in a single chip.

25. (New) The system of claim 24 wherein the memory device further comprises, on the single chip, an error detection correction engine connected to the compression and decompression engine.

26. (New) A system comprising:

a processor; and

a memory device connected to the processor, the memory device including:

a plurality of dynamic memory blocks;

a compression and decompression engine connected to the dynamic memory blocks;

and a static memory block connected to the compression and decompression engine; and

an error detection correction engine connected to the compression and decompression engine, wherein the dynamic memory blocks, the compression and decompression engine, the static memory block, and the error detection correction engine are located in a single chip.

27. (New) The system of claim 26 further comprising a graphic control card connected to the memory device.

28. (New) The system of claim 27 further comprising a video control card connected to the memory device.

29. (New) A method of operating on data comprising:

receiving input data;

compressing the input data to produce compressed data;

storing the compressed data;

reading the compressed data; and

decompressing the compressed data, wherein receiving, compressing, storing, reading, and decompressing are performed on a single chip.

30. (New) The method of claim 29 further comprising:

detecting for an error during compressing and decompressing; and

correcting the error during compressing and decompressing.